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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/792,154

03/02/2004

Amit A. Merchant

Intel 2207/793203

4865

25693

7590

06/21/2006

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EXAMINER

DONAGHUE, LARRY D

ART UNIT

PAPER NUMBER

2154

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/792,154

Applicant(s)

MERCHANT ET AL.

Examiner

Larry D. Donaghue

Art Unit

2154

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-23 and 35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-23 and 35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08).
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2154

1. Claims 17-23 and 35.
2. The rejection is maintained and set forth below.
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth

Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 17-23 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gulati et al. (Performance Study of a Concurrent Multithreaded Processor) in view of Loikkanen et al. (A Fine-Grain Multithreading Superscalar Architecture) further in view of Steely, Jr. et al. (5,197,132).

6. All references were cited by applicant on paper filed 03/02/2004.

7. Gulati et al. taught the invention (claims 17 and 18) substantially as claimed allocating execution resources (page 293, col. 1, lines 42-46; page 296, col. 1, lines 15-29) determining that a first thread is stalled (page 297, col. 1) and continuing to allocate resources to the other threads (page 293, col. 1, lines 42-46; page 296, col. 1, lines 15-29).

As to claim 19, Gulati et al. taught the execution resources are allocated on a rotating priority basis (page 296, col. 1, line 1 - page 297 col. 1, line 46).

8. As to claim 21, Gulati et al. taught detecting a long latency instruction (page 297, col. 1).

9. Gulati et al. did not expressly teach temporarily storing an instruction of the first thread in a queue. Loikkanen et al. the temporarily storing one or more instructions of a stalled thread in a queue (page 166, col. 1, section titled Remote Loads and Stores) and inhibiting further allocation of resources to the stalled thread (page 293, col. 1, lines 42-46; page 296, col. 1, lines 15-29).

Art Unit: 2154

10. As to claim 20, Loikkanen et al. taught detecting the thread is no longer stalled, unloading the instruction from the queue and re-allocating the at least some execution resources to the thread (page 165, col. 1, lines 1-15 and col. 2, lines 6-12 and page 166, col. 1, section titled Remote Loads and Stores).

11. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine these references as the thread suspending instruction buffers are the key behind eliminating stalls as disclosed by Loikkanen et al. Neither of the previously cited reference expressly disclose the use of a replay queue Steely, Jr. et al. taught the use of a replay queue for temporally storing instruction which are executed incorrectly (col. 3, lines 1-3 and col. 16, lines 12-19). It would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teach of Steely, Jr. et al. with the previous reference to gain rapid access to the instruction sequence in which an error has occurred.

12. As to claim 22, Steely et al. taught re-executing the instruction from the first thread (col. 3, lines 1-3 and col. 16, lines 12-19).

13. As to claim 23, Gulati et al. did not expressly teach temporarily storing an instruction of the second thread in a queue. Loikkanen et al. the temporarily storing one or more instructions of a stalled thread in a queue (page 166, col. 1, section titled Remote Loads and Stores) and inhibiting further allocation of resources to the stalled thread (page 293, col. 1, lines 42-46; page 296, col. 1, lines 15-29).

14. Claim 35, fails to teach or define above and beyond claims 17 and 23 and is rejected for the reasons set forth above.

15. Applicant's arguments filed 02/23/2006 have been fully considered but they are not persuasive.

16. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

17. Applicant assertions particularly on page 6, of the arguments, fails to show support for the defining of stalls from the specification.

18. Further applicant admits that Steely et al. makes up the deficiencies of Gulati, "Steely is at least "determining that a first thread has stalled ; temporarily storing one or more instructions of the first threaded in a replay queue...".

Art Unit: 2154

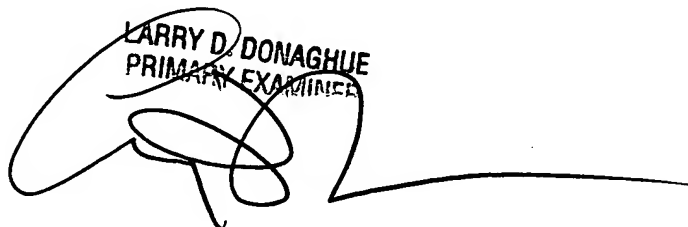
19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Larry D. Donaghue whose telephone number is 571-272-3962. The examiner can normally be reached on M-F 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on 571-272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


LARRY D. DONAGHUE
PRIMARY EXAMINER